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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:	
Jerrold V. Hauck, et al.	Examiner: Joseph D. Torres
Application No.: 09/059,533	
Filed: April 13, 1998	Art Group: 2133
For: EARLY ACKNOWLEDGMENT OF PRIMARY PACKETS	

Assistant Commissioner for Patents
Washington, D.C. 20231

SUPPLEMENTAL APPEAL BRIEF

Appellants submit, in triplicate, the following Supplemental Appeal Brief pursuant to 37 C.F.R. § 1.193(b)(2) and respectfully request reinstatement of an appeal that was the subject of Appellants' Appeal Brief filed on March 7, 2002. This Supplemental Appeal Brief is being filed following the re-opening of prosecution in a non-final Office Action dated July 31, 2002, which the Examiner issued in light of the arguments submitted in Appellants' March 2002 Appeal Brief.

Pursuant to 37 C.F.R. § 1.193(b)(2) and MPEP § 1208.02, Appellants do not submit a fee in connection with this Supplemental Appeal Brief since the fee has been previously paid. Please charge any additional amount due or credit any overpayment to Deposit Account 02-2666.

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I. REAL PARTY IN INTEREST

Jerrold V. Hauck, the party named in the caption, and David W. LaFollette transferred their rights to that which is disclosed in the subject application through an assignment recorded on April 13, 1998 (9117/0109) to Intel Corporation of Santa Clara, California. Thus, as the owner at the time the brief is being filed, Intel Corporation of Santa Clara, California is the real party in interest.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences that will affect or be affected by the outcome of this appeal.

III. STATUS OF CLAIMS

Claims 1-11 are pending in this application. All pending claims stand rejected and are presented for appeal.

IV. STATUS OF AMENDMENTS

No amendments have been filed subsequent to the Final Office Action mailed November 7, 2001.

V. SUMMARY

Pursuant to MPEP § 1208.02, Appellants hereby incorporate by reference from Appellants' Appeal Brief filed March 7, 2002, the section entitled "Summary of the Invention."

VI. ISSUES

The issues involved in this Appeal are as follows:

Are Claims 1, 2, 4-6, and 8-11 anticipated by U.S. Patent No. 4,888,684 to Lilja, et al. ("Lilja")?

Are Claims 3 and 7 obvious over Lilja in view of IEEE Standard for a High Performance Serial Bus, IEEE Standard 1394-1995 ("IEEE 1394")?

VII. GROUPING OF CLAIMS

Appellants submit that the claims do not stand or fall together. Accordingly, Appellants group the claims as follows:

Group I: Claims 1, 2, 4-6 and 8

Group II: Claims 9-11

Group III: Claim 3

Group IV: Claim 7

The reason for the independent patentability of the separate groups is discussed in detail below.

VIII. ARGUMENT

A. Overview of the Cited References

1. Overview of Lilja

Lilja discloses a bus protocol system for interprocessor communications that involve polling the processors of a multiprocessor unit in an open loop fashion to determine which processors are ready to send. Upon completion of a simultaneous poll of all processors, the system identifies which processors are ready to send by utilizing a send mask generated by the

ready processors. The ready processors are sequentially selected as send processors and granted access to the bus for a complete data transfer cycle unless the selected processor indicates it is not ready to send (Abstract).

If the first processor is ready to send, the first processor will place the first word of a 16-word packet (Col. 10, lines 14-16) onto a bus and will assert a signal line (e.g., RCVCMD line). The first word of the packet contains the address of the receiver processor, and the combination of the signal line assertion and the first word in the packet selects the processor to receive the packet (Col. 10, lines 29-35). If the receiver processor is not ready to receive the packet, the receiver processor will assert a NAK signal for two cycles. When the first processor receives the NAK signal, the first processor aborts the data transfer (Col. 10, lines 37-39).

Lilja states that the polling system disclosed therein is more efficient than existing systems because polling proceeds automatically without needing positive requests for access from the processors and because selection and enablement proceeds automatically without requiring positive ready acknowledgement from the processors (emphasis added) (Col. 2, lines 52-57).

2. Overview of IEEE 1394

IEEE 1394 discloses a standard for a high performance serial bus. (IEEE 1394, Abstract.) The serial bus architecture is defined in terms of communication protocols and nodes. (IEEE 1394, §3.1) Nodes are logical entities with unique addresses. (See id.) The communication protocols are described as a hierarchy wherein a high-level transaction layer utilizes a low-level link layer. (IEEE 1394, Fig. 3-4, § 3.4.) The transaction layer defines high-level operations to read data from another node or write data to a node. (See id.) The link layer implements the transaction layer's read and write operations by providing a one-way 64 bit data packet transfer service with acknowledgement. (See id.)

Figure 3-11 in IEEE 1394 illustrates a typical packet transfer involving the transaction layer and the link layer. (IEEE 1394, Fig. 3-11, § 3.6.2.1.) A source node (or requestor) initiates a write request at the transaction layer which, in turn, causes the link layer to

transmit a data packet to a destination (or responder) node. (See id.) Once the data packet is received in its entirety at the destination node link layer, the destination node link layer transmits an acknowledgement packet (ACK) to the source node. (See id.)

The process of transferring a packet via the link layer from a source node to a destination node is called a "subaction." (IEEE 1394, § 3.6.) A subaction may be asynchronous or isochronous. (See id.) Asynchronous subactions are comprised of a packet transmittal followed by an acknowledgement transmittal. (See id.) An isochronous subaction consists of a packet transmittal without an acknowledgment. (See id.) The acknowledgement packet contains a code to notify the source node that the destination node successfully received the packet or that the source node should resend the packet later. (IEEE 1394, § 3.6.2.4.) An acknowledgement code that indicates the destination node could not receive the packet is, for purposes of this discussion, a NAK. Thus, IEEE 1394 discloses that the link layer transmits a packet in its entirety and, if the packet is asynchronous, an ACK/NAK is transmitted to the source node thereafter.

B. Group I: Rejection of Claims 1, 2, 4-6, and 8 as being anticipated by Lilja

The Examiner rejects Claims 1, 2, 4-6, and 8 under 35 U.S.C. 102(b) as being anticipated by Lilja. Appellants respectfully traverse this rejection.

In order to anticipate a claim, the relied upon reference must disclose every limitation of the claim. Among other limitations, independent Claims 1, 4 and 5 each recite either transmitting or receiving a primary packet. Appellants submit that at least these limitations are not disclosed by Lilja.

In making the rejection, the Examiner relies on Lilja to show a bus protocol system for interprocessor communications using a 16-word packet. The Examiner states, erroneously, that Appellants teach that a primary packet is a packet consisting of various subactions (or words, since a word and a subaction are synonymously used to mean a subdivision of a packet). From this, the Examiner concludes that the packets of Lilja are primary packets as used in Appellants' claims since the packets of Lilja consist of 16 words (e.g., 16 subactions).

In response, Appellants first note that the definition of a "primary packet" being a "packet consisting of subactions" was originally submitted by the Examiner in the Office Action dated July 5, 2001 (page 4, lines 3-5). In response to the erroneous definition given by the Examiner in July 2001, Appellants submitted a Response to Office Action indicating Appellants' disagreement with the Examiner's assertion that primary packets are comprised of subactions or subpackets. (Response to Office Action filed on October 4, 2001, page 2, third full paragraph). In that same Response, Appellants asserted that a subaction is actually an operation that contains a primary packet, and therefore, a subaction cannot properly be considered to be a subgrouping of a primary packet (page 2, third full paragraph).

In response to the arguments submitted in Appellants' October 2001 Response, the Examiner assumed that "primary packet" should be interpreted in accordance with the definition of "primary packet" set forth in IEEE 1394. IEEE 1394 defines a primary packet as a packet made up of whole quadlets containing a transaction code in the first quadlet (emphasis added) (Final Office Action dated November 7, 2001, page 2, second full paragraph). Given this interpretation of the term "primary packet," Appellants submit that Lilja does not disclose a primary packet as recited in Appellants' independent Claims 1, 4, and 5.

Specifically, a primary packet, as interpreted by the Examiner, contains a transaction code, which specifies packet format (e.g., asynchronous or isochronous) and the type of transaction to be performed (IEEE 1394, Sections 6.2.1 and 6.2.4.5). The packet format and transaction type are used to grant bus access to requesting devices coupled to the bus based on a prioritization scheme. Namely, the packet format in the transaction code is used to grant bus access to devices requesting to conduct higher priority transactions (e.g., isochronous transactions) before granting access to devices requesting to conduct lower priority transactions (e.g., asynchronous transactions).

As discussed above, Lilja discloses a system based on polling and does not need positive requests for access from the processors because selection and enablement (e.g., access to the bus) proceeds automatically in a sequential manner without requiring positive ready acknowledgements

from the processors (Col. 2, lines 52-57). Since Lilja teaches away from arbitration (e.g., positive requests for bus access) and does not disclose any packets with a transaction code to specify packet format and transaction type, primary packets, as interpreted by the Examiner, are not disclosed by Lilja. Thus, at least this limitation of independent Claims 1, 4 and 5 is not disclosed by Lilja.

Accordingly, Appellants respectfully request that the rejection of independent Claims 1, 4 and 5 be overturned. Claims 2, 6, and 8 respectively depend from independent Claims 1 and 5 and contain all of the respective limitations thereof. Therefore, the rejection of the dependent claims should be overturned at least for the same reasons as their respective independent claims.

C. Group II: Rejection of Claims 9-11 as being anticipated by Lilja

Similar to independent Claims 1, 4 and 5 discussed above in reference to Group I, independent Claim 9 recites a "primary packet," and therefore, all of the arguments and reasoning set forth above regarding the lack of any disclosure by Lilja of a primary packet, as defined by the Examiner, apply equally here to Claim 9. However, Claim 9 is also independently not anticipated by Lilja.

Specifically, Claim 9 recites that a NAK is generated by a state machine concurrently with an ongoing arrival of a primary packet (emphasis added). In this regard, Appellants note that any NAK sent by the destination processor in Lilja is transmitted only in response to recognition of the first word of the 16 word packet and at no subsequent time. Thus, a NAK sent by the destination processor after a single word is placed on the D bus to merely identify the destination processor cannot be properly considered to be sent concurrently with an ongoing arrival of the primary packet since arrival does not continue (e.g., is not ongoing) if the destination processor sends the NAK once the first word of the packet is placed on the D bus (Col. 10, lines 32-37). Thus, at least this limitation is not disclosed by Lilja.

Accordingly, Appellants submit that the rejection of Claim 9 should be overturned. Claims 10 and 11 depend from Claim 9 and contain all of the limitations thereof. Therefore, the rejection of the dependent claims should be overturned at least for the same reasons as Claim 9.

D. Group III: Rejection of Claim 3 as being obvious over Lilja in view of IEEE 1394

Claim 3 is dependent upon independent Claim 1, discussed above, and the reasoning and arguments set forth above pertaining to Claim 1 apply equally here to Claim 3. However, Claim 3 is also independently not obvious over Lilja in view of IEEE 1394. Specifically, the primary packet, as defined by the Examiner to correspond to an IEEE 1394 primary packet, is not compatible with the system disclosed in Lilja since a packet with a transaction code to enable arbitration is not compatible with the system of Lilja that grants bus access automatically in a sequential manner. Therefore, the cited references in combination fail to teach or suggest at least this limitation of Claim 3.

Claim 3 additionally recites granting the bus to a highest priority requesting node and beginning transition of a next primary packet from the highest priority requesting node. As mentioned earlier, Lilja teaches away from arbitration and grants access to the bus in a purely sequential manner with no regard to priority or device requests. Therefore, Lilja must also teach away from the limitations of Claim 3 directed towards granting bus access based on a determination of which requesting node has the highest priority and beginning transmission of a next primary packet from the highest priority requesting node.

IEEE 1394 fails to cure the deficiencies of Claim 3 in that IEEE 1394 is not properly combinable with Lilja and further fails to teach or suggest receiving a NAK while the primary packet is being transmitted and aborting the transmission without sending all of the primary packet, as recited in Claim 3. Thus, the cited references in combination fail to teach or suggest all of the limitations of Claim 3.

Accordingly, Appellants respectfully request that the rejection of Claim 3 be overturned.

E. Group IV: Rejection of Claim 7 as being obvious over Lilja in view of IEEE 1394

Claim 7 is dependent on patentable independent Claim 5, discussed above, and the reasoning and arguments set forth above regarding independent Claim 5 apply equally here to Claim 7. However, Claim 7 is also independently nonobvious over Lilja in view of IEEE 1394.

Similar to Claim 3, Claim 7 recites granting the bus to a highest priority requesting node upon aborting the transmission of a primary packet. As discussed above, Lilja teaches away from any type of arbitration requiring a positive request for bus access. Rather, Lilja grants bus access in a sequential manner to devices that are ready to send data across the bus. Therefore, in light of Lilja's teaching away from arbitration and the Examiner's interpretation of "primary packet," Lilja and IEEE 1394 are incompatible and cannot be properly combined to render Claim 7 obvious.

Moreover, Claim 7 recites a tree topology, which is neither taught nor suggested by Lilja. However, IEEE 1394 cannot cure this deficiency due to the incompatibility of the two references. IEEE 1394 also fails to teach or suggest a destination node to generate a NAK if the primary packet cannot be successfully accepted, wherein the NAK is generated concurrently with the receipt of the primary packet, as recited in Claim 7.

Accordingly, Appellants respectfully request that the rejection of Claim 7 be overturned.

IX. CONCLUSION AND RELIEF

Based on the foregoing, Appellants request that the Board overturn the rejection of all pending claims and hold that all of the claims of the present application are allowable.

Respectfully submitted,

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CERTIFICATE OF MAILING:

I hereby certify that this correspondence is being deposited as First Class Mail with the United States Postal Service in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on October 31, 2002.

Margarx Rodriguez — 10/31/02 Date

X. APPENDIX

The claims involved in this Appeal are as follows:

1. (Amended) A method comprising:

transmitting a primary packet from a source node towards a destination node on a full duplex bus;

receiving a NAK while the primary packet is being transmitted; and

aborting the transmission without sending all of the primary packet.

2. (Amended) The method of Claim 1 further comprising:

reclaiming bandwidth not used as a result of aborting.

3. (Amended) The method of Claim 2 wherein reclaiming comprises:

granting the bus to a highest priority requesting node; and

beginning transmission of a next primary packet from the highest priority requesting node.

4. (Amended) A method comprising:

receiving a primary packet at a destination node;

identifying, during the receiving, that the node cannot successfully accept the primary packet; and

sending a NAK to the originator of the primary packet concurrently with the receiving.

5. A system comprising:

a full duplex bus;

a source node coupled to the bus, the source node to transmit a primary packet; and

a destination node coupled to the bus, to receive the primary packet, the destination node to generate a NAK if the primary packet cannot be successfully accepted, the NAK generated concurrently with the receipt of the primary packet.

6. The system of claim 5 wherein the source node aborts a transmission responsive to the NAK.

7. The system of claim 6 further comprising:

a plurality of additional nodes coupled to the bus to form a tree topology wherein the source node grants the bus to a highest priority requesting node upon aborting the transmission.

8. The system of claim 5 wherein an inability to accept the primary packet is caused by unavailability of a needed resource.

9. An apparatus comprising:

a transceiver;

a state machine coupled to the transceiver, the state machine to generate NAK in response to an inability to successfully accept a primary packet, the NAK generated concurrently with an ongoing arrival of the primary packet.

10. The apparatus of claim 9 wherein the inability to accept is caused by resource unavailability.

11. The apparatus of claim 9 wherein when the apparatus is a source of a primary packet, it aborts a transmission of the primary packet when a NAK is received.